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OPTICAL MONITORING OF GM SGR AND DISCOVERY OF A MIRA AND A SHORT-PERIOD PULSATOR

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This Note is the third in a series of Notes where we report new variable stars discovered during our extensive CCD monitoring program of the black hole binary V4641 Sgr (SAX J1819.3-2525, Orosz et al. 2001). In this Note we report on the discovery of a Mira and a short-period pulsating star. We also give the light curves of GM Sgr, a previously known Mira (Orosz 2000, Kato et al. 2001).

The reader is referred to our first Note (Gieles et al. 2002) for a complete discussion of the telescopes and data reduction techniques used.

Table 1. Photometric data.

Coordinates (J2000)	V	average $V-I$	period (days)	T_0 (HJD 2 450 000+)	ID
18:19:36.7 -25:25:53.1	$12.0-16.8$	4.2	$\sim$208	2015	...
18:19:21.5 -25:25:37.6	$13.1-18.2$	3.6	212	2010	GM Sgr
18:19:11.0 -25:23:20.3	$18.3-17.4$	1.5	0.163	2015.025	...

We found three stars that seem to be pulsating stars with well-defined periods. Only one of the three stars has been previously identified. YALO J181921.5-252538 is Luyten's variable GM Sgr (Luyten 1927), which in the past has been confused with V4641 Sgr. This star was spectroscopically classified as a Mira star by Orosz (2000). Kato et al. (2001) derived a photometric period of 212 days, in agreement with what we find here.

Table 1 gives an overview of the photometric information of the three sources identified, including coordinates, magnitude and color ranges and ephemeris information (T_0 is the epoch of minimum light). Figs. 1 and 2 show light curves for each source in different bands. Figs. 3 and 4 show the finding charts for each source. As in our previous Notes, the names of the stars are based on their coordinates in equinox 2000 and are given the

prefix YALO since most of the variables were discovered with the data of the YALO telescope (Bailyn et al. 1999).

YALO J181936.7-252553 is a Mira very similar to GM Sgr (i.e. they both have nearly the same period and V-band amplitude). YALO J181911.0-252320 is most probably a pulsating star of the δ Scuti type.

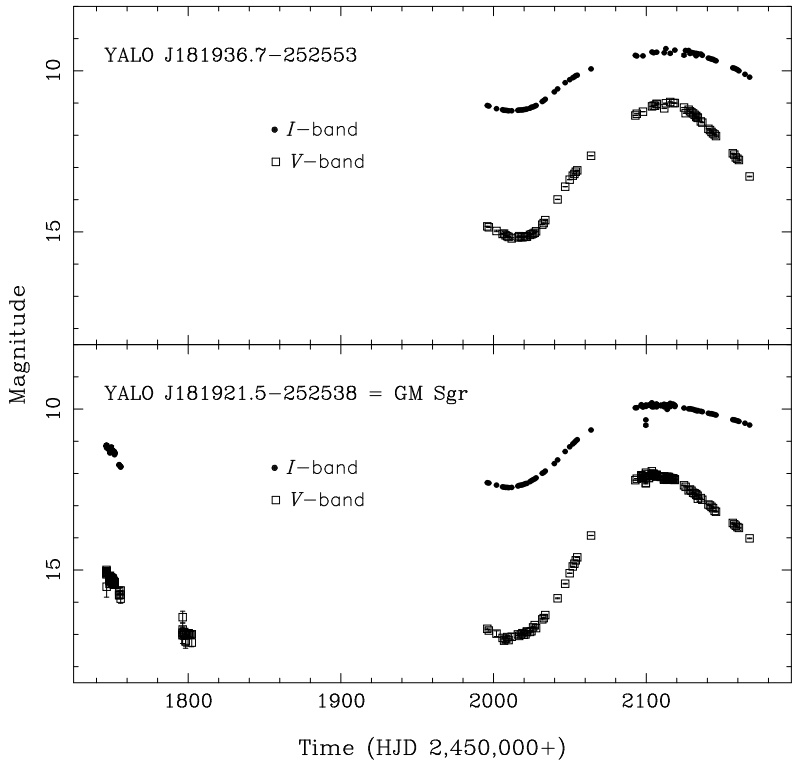

Figure 1. Top: light curves of YALO J181936.7-252553 in V and I. Bottom: light curves of YALO J181921.5-252538 = GM Sgr in the V and I band

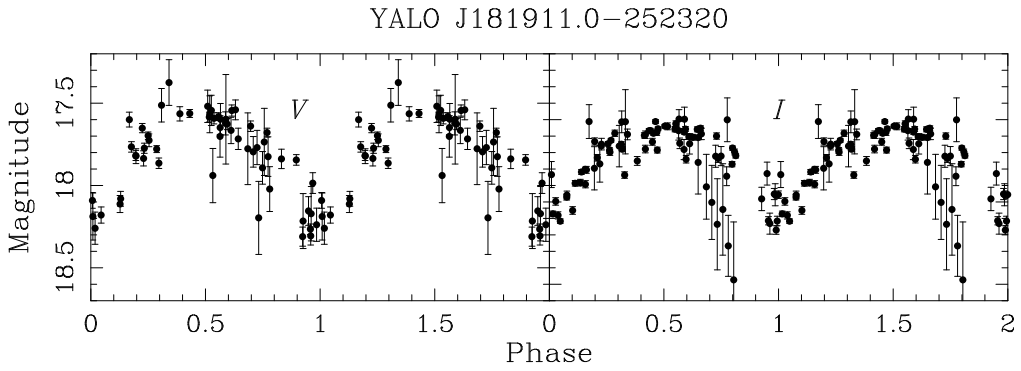

Figure 2. Folded light curves of YALO J181911.0-252320. Left: V-band. Right: I-band.

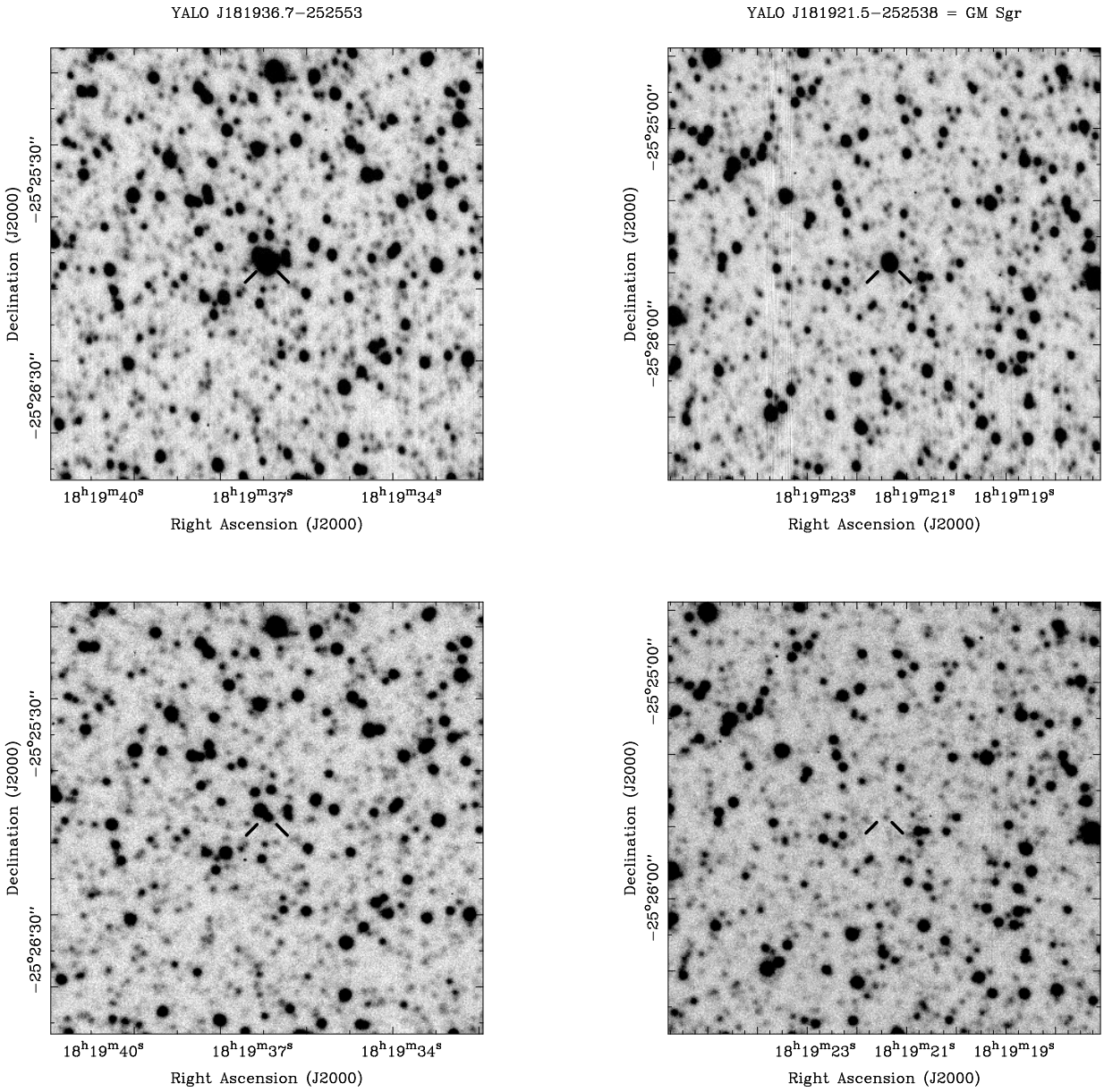

Figure 3. V-band finding charts of YALO J181936.7-252553 (left column) and GM Sgr = YALO J181921.5-252538 (right column). The top row shows single frames in which both sources are at maximum brightness. The second row shows single frames in which both sources at minimum brightness.

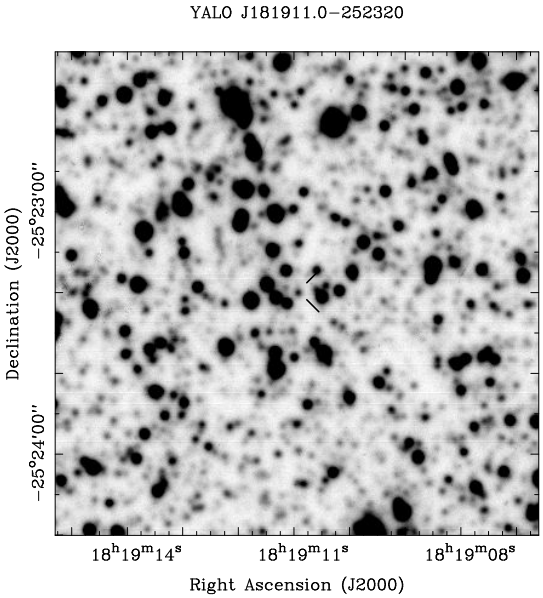

Figure 4. V-band finding chart of YALO J181911.0-252320. Source is in centre.

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